Catalogue no. 11-621-MIE — No. 064
ISSN: 1707-0503
ISBN: 978-0-662-47247-6

Analytical Paper

Analysis in Brief

International Trade by the Information and Communication Technologies Sector

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Managing Editor: Yvan Gervais

Production: Debi Soucy

November 2007

Catalogue No: 11-621-MIE2007064
ISSN: 1707-0503
ISBN: 978-0-662-47247-6
Frequency: Occasional
Ottawa

How to obtain more information:
National inquiries line: 1-800-263-1136
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Published by authority of the Minister responsible for Statistics Canada

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2008-00001/

International Trade by the Information and Communication Technologies Sector

Nicole Charron, Investment and Capital Stock Division

Summary

Canada is an important player in the international goods and services market. Together, Canada's imports and exports totalled near $1 trillion and generated a trade surplus of around $50 billion.

Historically, surpluses in Canada's trade in goods are partly offset by recurring deficits recorded in the services and investment income sectors. However, the Information and Communication Technologies (ICT) sector has always posted surpluses in its international transactions of commercial services between 1997 and 2005, ranging between $2.3 billion and $5.6 billion annually. In contrast, commercial services traded by all non-ICT industries were constantly in deficit.

The current account of Canada's balance of payments measures the value of economic transactions of Canadian residents with residents of other countries. The merchandise trade surplus is the largest part of the overall current account balance. Nonetheless, international transactions in services are an important component of the account and comprise four major categories: travel, transportation, commercial services and government services.

Commercial services, the largest of these four categories, accounted for 6.4% of exports and 7.0% of imports in Canada's current account in 2005. This category covers a broad range of activities such as insurance, management, architecture, royalties, fees and licences, informatics and information, engineering and technical services and research and development.

Many of the firms dealing in commercial services are in the ICT sector. These firms are involved in various components of information and communication technology such as computer services, software publishing and telecommunication. The ICT sector is one of the driving forces that determine the size of the trade balance in commercial services.

In 2005, commercial services firms had transactions in both exports and imports totalling nearly $75.4 billion. In the ICT sector alone, transactions in commercial services amounted to close to $16.4 billion, about one-fifth of the total. In 2005, the commercial services sector posted a trade deficit of just over $1.6 billion. However, this deficit would have been much larger without the ICT sector, which posted a surplus of $4.0 billion.

Within the ICT sector, the information and cultural industries group was the most significant accounting for 54% of the surplus in international trade of commercial services in 2005. The manufacturing industries group in the ICT sector both imported and exported large volume of services at the turn of the millennium to deal with unprecedented demand for compatibility of computer systems in the 2000s. However, this industry group posted a slight deficit in 2005, after eight straight years of surpluses.

This study examines the impact of the ICT sector on trade balance in commercial services. It explores the evolution of the sector's impact by type of service, by industry and by affiliation of the companies involved.

Definitions

Information and communication technologies

Information and Communication Technologies (ICT) touch every sector of our economy. These technologies facilitate the sharing of information and ensure more effective delivery of services while eliminating the barriers of time and distance. With the innovation, competition and globalization movements, ICT is changing the way that people do business and communicate.[1] ICT covers a long list of goods and services, including such traditional technologies as telephone and television, as well as more recent technologies such as cellular telephones and the Internet. ICT goods are used to process information and to communicate by electronic means, while ICT services make these functions possible.[2]

The information and communication technologies sector

The ICT sector includes industries operating mainly in the production of goods and services or in implementation of technologies used to capture, process, transmit, receive or display data and information by electronic means. It comprises eight manufacturing industries and fifteen services industries as classified within the North American Industry Classification System (NAICS).[3] This sector accounted for almost 6% of the gross domestic product in 2005.

Services

For the purpose of data on international trade, services are grouped into four main categories: travel, transportation, commercial services and government services.

Commercial services

This grouping encompasses all services that are not travel, transportation or government services. Commercial services[4] cover a broad range of activities including: insurance, management, royalties, fees and licences, informatics and architecture, information, engineering and technical services, research and development.

Computer services

These services cover the design, engineering and management of computer systems (excluding the value of the hardware) and the development and production of original software (including operating software and software used for the Internet), but not units of packaged software destined for general commercial or personal use. They also include computer processing services and the repair and maintenance of hardware, consulting services and specific training related to the preceding services. However, computer services do not include fees, licences and other software use charges.

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1. For an overview of ICT, see *Canada's Journey to an Information Society*, 2003, Statistics Canada Catalogue No. 56-508-XIE, http://www.statcan.ca/bsolc/english/bsolc?catno=56-508-X (accessed November 16, 2007).
2. For a more detailed definition, see *Guide to Measuring the Information Society*, 2005, OECD, http://www.oecd.org/document/22/0,3343,en_2649_34449_34508886_1_1_1_1,00.html (accessed February 23, 2007).
3. The list of industries included in the ICT sector is available on the Statistics Canada website at the following address: http://www.statcan.ca/english/Subjects/Standard/spec-agoreg/ict-2002/ict02-menu.htm (accessed February 23, 2007). For the most recent definition used by OECD, see *Information Economy - Sector Definitions Based on the International Standard Industry Classification (ISIC 4)*, 2007, OECD.
4. A more complete description of the various categories of commercial services appears in *Canada's International Trade in Services*, 2004, Statistics Canada Catalogue No. 67-203-XWE, http://www.statcan.ca/bsolc/english/bsolc?catno=67-203-X (accessed November 16, 2007).

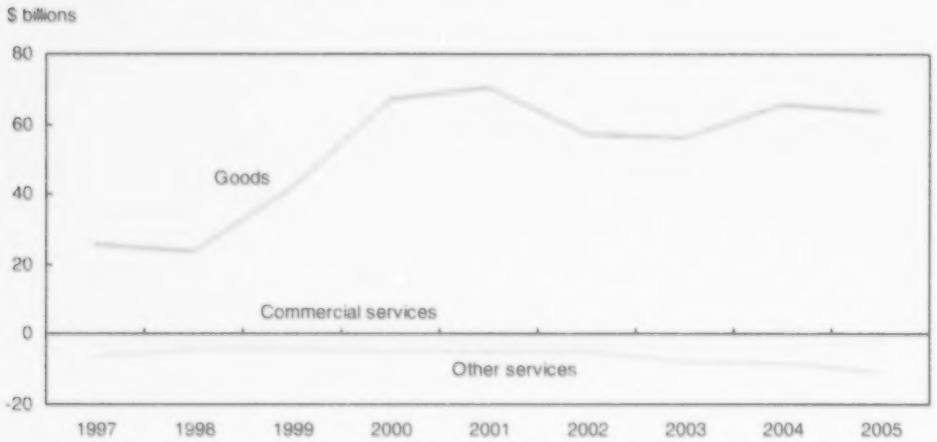
Unlike goods, trade in services is in the red

Canada's balance of payments provides information about the country's economic transactions with non-residents. It includes the current account and the capital and financial account.

The current account records transactions covering goods and services, investment income and current transfers. Transactions in exports and interest income are examples of receipts, while imports and interest expense are payments. The net balance of these transactions determines if Canada's current account is in surplus or deficit.

Unlike the goods sector, international trade in services overall has produced a recurrent trade deficit. The same holds true for each of the major components of services: travel, transportation and commercial services.

Chart 1
International trade in goods posts a surplus, but not services



Source: Statistics Canada, CANSIM table 376-0001.

In 2002, for example, Canada's deficit in international trade in services amounted to just over $7.2 billion. By 2005, this deficit had expanded to $12.2 billion. In contrast, the goods sector recorded a huge surplus for 2005 totalling to $63.5 billion.

Unlike goods which are transportable and thus usable away from the location where they were produced, services are generally consumed where and while they are produced. This explains why goods are generally more likely to be imported or exported than services. Services represented only about 14% of all imports and 12% of exports in the 2005 Canada's current account.

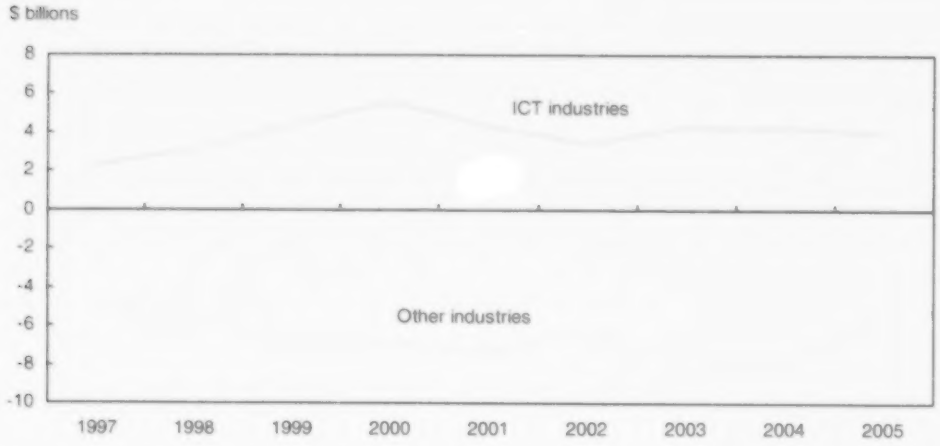
ICT sector international trade records surplus

Historically, Canada's good trade surplus comes from the sectors that exploit the nation's traditional resources in forestry, energy and agriculture.[5] This fact, combined with recurring deficits in commercial services trade balance, may leave the impression that Canada is a natural-resources-based economy rather than a knowledge-based economy. This is certainly not true in the case of the ICT sector. Indeed, this sector is a leading-edge component of the economy and it produces surpluses in its international transactions in commercial services.

In 2005, Canadian firms had transactions in both exports and imports totalling nearly $75.4 billion in commercial services. In the ICT sector alone, transactions amounted to $16.4 billion, about one-fifth of total commercial services transactions.

The positive balance posted by the ICT sector in commercial services has played a large role in reducing the size of the overall commercial services deficit in international transactions. Between 1997 and 2005, the ICT sector recorded trade surpluses in commercial services of between $2.3 billion and $5.6 billion annually. In contrast, other sectors were posting deficits of between $5.1 billion and $8.0 billion.

Chart 2
ICT industries post a surplus in its international trade of commercial services, unlike other industries



Source: Statistics Canada, special tabulation, Balance of Payments Division.

The year 2000 was pivotal for the ICT sector. Its commercial services transactions abroad peaked that year, with exports hitting $11.1 billion and imports, $5.5 billion. This resulted in a surplus of $5.6 billion. In 2005, the ICT surplus was $4.0 billion, as a result of exports of $10.2 billion and imports of $6.2 billion.

5. See Philip Cross and Diana Wyman, "The changing composition of the merchandise trade surplus," *Canadian Economic Observer*, 2006, Vol. 19, no. 11, Statistics Canada Catalogue No. 11-010-XIB-2006011, http://www.statcan.ca/english/freepub/11-010-XIB/01106/feature.htm (accessed November 16, 2007).

Industries in the ICT sector accounted for about 28% of exports and 16% of imports in 2005. These proportions are similar for previous years.

Most services in the ICT sector contributed to its trade surplus

The majority of services provided by ICT industries have contributed to the sector's trade surplus in international transactions. The services with the highest volume of transactions such as computer services, research and development (R&D), pre-packaged software and computer royalties recorded the highest surpluses.

ICT industries are the main importers and exporters of computer services in Canada. In 2005, computer services accounted for $2.4 billion of the $4.0 billion ICT trade surplus (about 60%) and 34% of ICT exports. By comparison, exports and imports of computer services by other non-ICT industries accounted for $0.7 billion and 0.4 billion respectively.

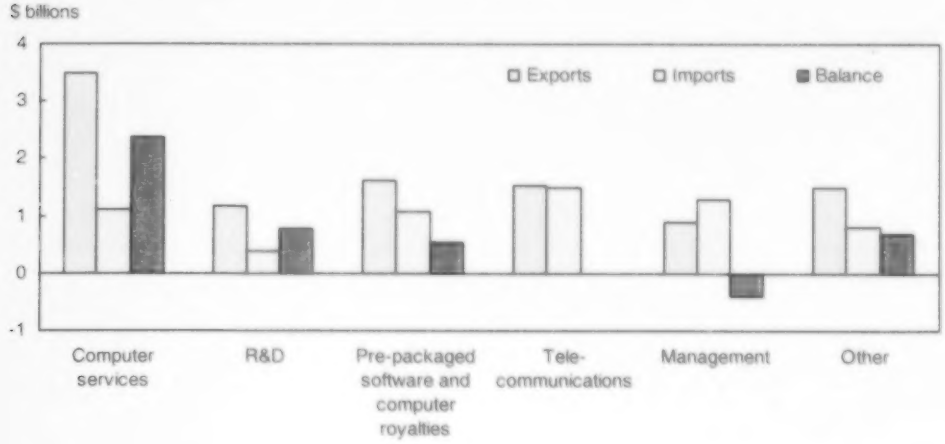
Second to computer services are research and development (R&D) services which are sold and purchased by ICT industries on the international market. Exports and imports of R&D services increased sharply in 2000. The gain was probably due to investments made by various companies to ensure compatibility of their computer systems with the new millennium and the end of the high tech boom. Overall, between 1997 and 2005, ICT industries sold more R&D services than they purchased, generating a $0.8 billion surplus in 2005.

Software and computer royalties ranked third among ICT industries in terms of trade surplus. In 2005, they exported a total of $1.6 billion while imports amounted to $1.1 billion, generating a surplus of $0.5 billion. Industries not in the ICT sector also purchase software and pay computer royalties to foreign companies for a total of $0.3 billion on 2005.

Telecommunications services imported and exported by ICT industries amounted to $1.5 billion each in 2005. Since 1997, the telecommunications trade balance has fluctuated around zero.

The only deficits between 1997 and 2005 were recorded by the management services component, which represented 8% of exports and 21% of imports by ICT industries. It produced a deficit in 2005 after three straight years of surpluses. Unlike other services in the ICT sector, the demand for management services varies widely from year to year, fluctuating between surplus and deficit years.

Chart 3
Computer services dominate trade surplus of ICT industries in 2005



Source: Statistics Canada, special tabulation, Balance of Payments Division.

Major ICT industry groups record surpluses

Of the four industrial groups making up the ICT sector, the two largest ones produced surpluses in their international trade in commercial services between 1997 and 2005. These industries were the information and cultural industries group and the professional, scientific and technical services group. ICT industries in these two groups are also among those that are most advanced in the use of electronic commerce and technology.[6]

Industries in the other two groups—manufacturing and trade, transportation and others—experienced deficits for the first time in 2005.

ICT industries in the information and cultural industries group were the largest, with 44% of ICT exports and 54% of the total corresponding surplus in 2005. Computer services had the largest impact on the surplus of these industries. The combined effect over the years of increased exports and lower imports expanded the surplus of these industries in computer services transactions.

Prior to 2002, industries in the professional, scientific and technical services groups dominated the ICT surplus. However, the slide in exports since 2000, combined with the growth in imports, reduced the surplus for these industries from $2.9 billion in 2000 to $2.0 billion in 2005.

Professional, scientific and technical services companies are larger and concentrated in the hands of a few corporations that dominate this sector. In 2005, the 10 largest companies accounted for almost 40% of the exports and 87% of the imports by all of these industries. Imports of computer services by these companies have risen in recent years, reducing their surplus.

6. See "Electronic commerce and technology," *The Daily*, April 20, 2006, Statistics Canada Catalogue No. 11-001-XWE, http://www.statcan.ca/bsolc/english/bsolc?catno=11-001-X (accessed November 16, 2007).

Information and cultural services industries are generally smaller, more numerous and less concentrated. However, in general, cultural industries consist of a few large companies, vertically integrated and often under foreign control, and a large number of small companies, normally under Canadian control. About 10 companies account for half of exports and over three-quarters of the imports by the entire information and cultural industries group in 2005. Computerization is a strong trend across this group.[7]

Non-ICT industries have reported deficits in their commercial services for both the goods producing industries (manufacturing and other goods producing industries) and services producing industries (trade and transportation; information, culture and arts; finance and insurance; professional, scientific and technical services; other services producing industries).[8] Note that there are no ICT industries in agriculture and mining, finances and insurance, and management of companies and enterprises.

First deficit in commercial services for ICT manufacturers in 2005

For 30 years, the manufacturing industries and the finance and insurance industries have contributed the most to the overall deficit in commercial services. However, manufacturing industries that make up the ICT sector recorded surpluses from 1997 to 2004.

In 2005, they posted their first deficit in commercial services, some $165 million, while other manufacturers accumulated a deficit of $5.0 billion.

Exports and imports by manufacturers in the ICT sector peaked in 2000 and in the following two years dropped by two-thirds in the case of exports and by more than half for imports.

In 2004 and 2005, increased exports of services by manufacturers of semi-conductors and other electronic components were not enough to offset several years of lower exports by other manufacturers, especially manufacturers of radio and television broadcasting and wireless communication equipment. Export revenue from these latter manufacturers reached $49.0 million in 2005, a small fraction of the $2.6 billion earned in 2000.

The relative weakness of international trade in commercial services by manufacturers in the ICT sector led to a rise in the importance of the services industries. In 2000, services industries accounted for about 70% for both exports and imports of commercial services by the ICT sector. In 2005, these proportions climbed to 88% of exports and 78% of imports.

ICT industries in the trade, transportation and other industries group accounted for only 7% of exports and 12% of imports of all international trade in commercial services by the ICT sector. This group experienced a slight trade deficit for the first time in 2005.

The shift in international trade to ICT services industries reflects trends in output. In fact, in 2005, the output of manufacturers in the ICT sector remained below that of the peak in 2000, while the output of ICT services industries continued to climb at a faster pace than for the business sector as a whole.

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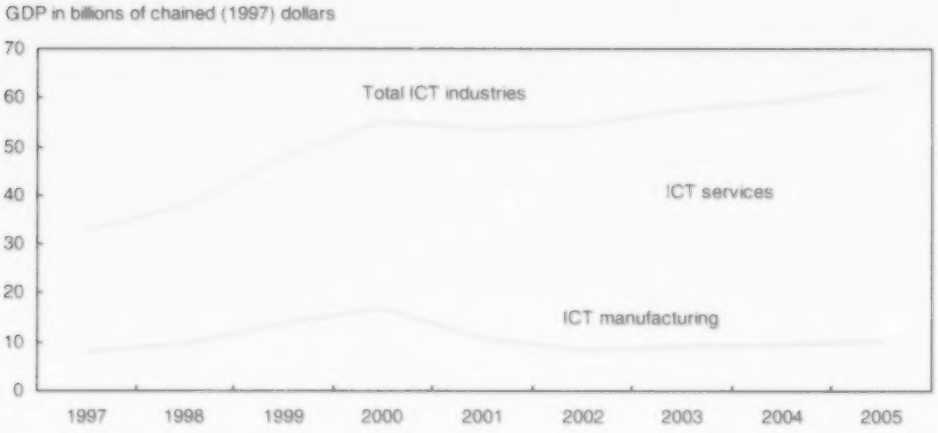
7. See "Electronic commerce and technology," *The Daily*, April 20, 2006, Statistics Canada Catalogue No. 11-001-XWE, http://www.statcan.ca/bsolc/english/bsolc?catno=11-001-X (accessed November 16, 2007).
8. See *Canada's international trade in services*, 2004, Statistics Canada Catalogue No. 67-203-XWE, http://www.statcan.ca/bsolc/english/bsolc?catno=67-203-X (accessed November 16, 2007).

The gross domestic product for the ICT sector as a whole grew at an annual average pace of 8.4% between 1997 and 2005, more than twice the 3.6% rate of growth in the business sector.

Chart 4
Gross Domestic Product of ICT services industries continued to grow while that of manufacturing industries is stalled after a drop at the start of the millennium



Source: Statistics Canada, CANSIM table 379-0020.

Trade surpluses with all major partners

The ICT sector recorded trade surpluses with its major foreign partners in commercial services, while the other sectors continued to post deficits.

The United States market is by far the largest. Commercial services purchased from the United States in 2005 amounted to $4.7 billion for the ICT sector and $23.1 billion for all other sectors. Some $7.0 billion in services was provided to companies in the United States by the ICT sector compared to $15.9 billion by the other sectors.

The European market was a distant second, purchasing commercial services worth $1.4 billion from the ICT sector and $5.1 billion from other sectors.

Computer services continue to drive transactions. Almost all computer services are traded with the United States. Indeed, 82% of exports and 93% of imports in computer services traded by the ICT sector were traded with the United States in 2005.

Surpluses for both affiliates and non-affiliates

Research has demonstrated[9] that Canadian firms with international links—those that are active in export markets or that have production activities outside Canada—often stack up well against foreign multinationals which enjoy performance advantages over many domestic companies. One indicator of such international ties is a firm's rate of international transactions with its affiliates and non-affiliates.

In the information and cultural industries group, rates of imports and exports with affiliates were lower than with non-affiliate partners. This suggests that industries in this group are more active with non-parent partners on the export markets than they are with their own affiliates. The professional, scientific and technical services group also had a lower rate of exports with their affiliates but they reported more import transactions with their affiliates than with their non-affiliates partners.

The manufacturing and the trade, transportation and others groups generally recorded higher rates of international transactions with their affiliates than with non-affiliates.

In total, trade surpluses were recorded in international trade with both affiliates and non-affiliates. In the case of affiliates, the surplus was $0.7 billion in 2005, compared to $3.2 billion for non-affiliates.

9. See John Baldwin and Guy Gellatly, "Global Links: Multinationals in Canada: An overview of Research at Statistics Canada," *The Canadian Economy in Transition*, 2007, Statistics Canada Catalogue No. 11-622-MIE2007014, http://www.statcan.ca/bsolc/english/bsolc?catno=11-622-MIE2007014 (accessed November 16, 2007).

Table 1
Percentage of the value of exports and imports of commercial services transacted by affiliates and non-affiliates by industry group, Canada, 2005

	Exports		Imports	
	Affiliates	Non-affiliates	Affiliates	Non-affiliates
	%			
Manufacturing	82	18	85	15
Information and culture	33	67	33	67
Trade, transportation and other	85	15	95	5
Professional, scientific and technical services	36	64	61	39
Total	**44**	**56**	**60**	**40**

Source: Statistics Canada, special tabulation, Balance of Payments Division.